

CLAIMS

1. A method for eliciting an immune response to an antigen in a subject comprising

5 (a) administering at least one antigen-presenting cell (APC) chemotaxin and an antigen.

2. A method of enhancing an immune response of a subject to an antigen comprising administering an APC chemotaxin and the antigen.

3. The method of claim 2, wherein the immune response is an antibody-mediated immune response.

4. The method of claim 3, wherein the administering increases the titer of antigen-specific antibodies by greater than at least 2-fold.

5. The method of claim 2, wherein the immune response is a cell-mediated immune response.

6. The method of claim 2, wherein the APC chemotaxin is chemotactic for a dendritic cell.

7. The method of claim 2, wherein the APC chemotaxin is chemotactic for an immature dendritic cell.

8. The method of claim 2, wherein the APC chemotaxin and antigen are co-administered.

9. The method of claim 2, wherein the APC chemotaxin and antigen are administered separately.

10. The method of claim 2, comprising administering at least two APC chemotaxins.

11. The method of claim 2, wherein the APC chemotaxin is a chemokine polypeptide or a variant thereof.

12. The method of claim 2, wherein the APC chemotaxin is a chimeric polypeptide comprising a sequence of at least 10 contiguous residues from a chemokine polypeptide and a sequence of at least 10 contiguous residues from a second chemokine polypeptide.

13. The method of claim 11, wherein the chemokine polypeptide is selected from the group consisting of hMIP1 α , hMIP1 α (70aa), mMIP-1 α , hRANTES, hMET-RANTES, mRANTES, hHCC-1, hMPIF-1, hMPIF-1 (22-137), hMPIF-1 (46-137), hMIP-1 δ , hMCP-4, mMCP-5, mMARC, mEotaxin, mMCP-1(JE), mTECK, mMIP-2, mBLC, hLeukotactin, mMIG, mMIP-1 β , hMCP-2, hMCP-3, vMIP-1, hMIP-3 α , hMIP-3 β , mC10, mMDC, hMIP-1 β , vMCK-2, and mMIP-1 γ .

14. The method of claim 11, wherein the chemokine polypeptide is selected from the group consisting of mC10, mMDC, hMIP-1 β and mMIP-1 γ .

15. The method of claim 11, wherein the chemokine polypeptide is mC10.

16. The method of claim 11, wherein the chemokine polypeptide is vMCK-2.

17. The method of claim 11, wherein the chemokine polypeptide is selected from the group consisting of hMCP-2, hMCP-3, vMIP-1, hMIP-3 α , vMCK-2 and hMIP-3 β .

18. The method of claim 11, wherein at least one of the first or second chemokine polypeptide is selected from the group consisting of hMIP1 α , hMIP1 α (70aa), mMIP-1 α , hRANTES, hMET-RANTES, mRANTES, hHCC-1, hMPIF-1, hMPIF-1 (22-137), hMPIF-1 (46-137), hMIP-1 δ , hMCP-4, mMCP-5, mMARC, mEotaxin, mMCP-1(JE), mTECK, mMIP-2, mBLC, hLeukotactin, mMIG, mMIP-1 β , hMCP-2, hMCP-3, vMIP-1, hMIP-3 α , hMIP-3 β , mC10, mMDC, hMIP-1 β , vMCK-2, and mMIP-1 γ .

19. The method of claim 2, wherein the APC chemotaxin is formulated in a sustained release pharmaceutical composition.

20. The method of claim 2, wherein the antigen is a polypeptide from a pathogen.
21. The method of claim 20, wherein the pathogen is *Hepatitis* or *Influenza*.
22. The method of claim 2, wherein the antigen is a tumor antigen.
23. The method of claim 2, further comprising administering an adjuvant.
24. The method of claim 23, wherein the adjuvant is selected from the group consisting of alum, incomplete Freund's adjuvant, a bacterial capsular polysaccharide, dextran, IL-12, GM-CSF, CD40 ligand, IFN-gamma, IL-1, IL-2, IL-3, IL-4, IL-10, IL-13, IL-18, and a cytokine.
25. The method of claim 2, further comprising a multivalent carrier.
26. The method of claim 25, wherein the multivalent carrier is linked to the APC chemotaxin, the antigen or an adjuvant.
27. The method of claim 25, wherein the multivalent carrier is selected from the group consisting of a bacterial capsular polysaccharide, a dextran and a genetically engineered vector.
28. The method of claim 27, wherein the bacterial capsular polysaccharide is from *Pneumococci*, *Streptococci*, or *Meningococci*.
29. The method of claim 2, further comprising administering a pharmaceutical carrier.
30. The method of claim 2, wherein the administering is into a solid tumor.
31. The method of claim 2, wherein the administering is into the tissue surrounding a solid tumor.
32. The method of claim 2, wherein the administering is injecting.

33. The method of claim 2, wherein the administering is inhaling.

34. The method of claim 2, wherein the administering an APC chemotaxin comprises administering a polynucleotide encoding the APC chemotaxin.

35. The method of claim 2, wherein the administering an antigen
5 comprises administering a polynucleotide encoding the antigen.

36. The method of claim 2, wherein the subject is a human.

37. A composition comprising
(a) at least one APC chemotaxin, and
(b) at least one antigen.

38. The composition of claim 37, wherein the APC chemotaxin is
substantially purified.

39. The composition of claim 37, wherein the APC chemotaxin is
chemotactic for dendritic cells.

40. The composition of claim 39, wherein the APC chemotaxin is
chemotactic for immature dendritic cells.

41. The composition of claim 37, wherein the APC chemotaxin is not
chemotactic for at least one cell selected from the group consisting of neutrophil, T
cell, B cell, monocyte and eosinophil.

42. The composition of claim 37, comprising at least two APC
20 chemotaxins.

43. The composition of claim 37, wherein the APC chemotaxin is a
chemokine polypeptide or a variant thereof.

44. The composition of claim 37, wherein the APC chemotaxin is a
chemokine polypeptide.

45. The composition of claim 44, wherein the APC chemotaxin is a naturally occurring chemokine polypeptide.

46. The composition of claim 37, wherein the APC chemotaxin is in a sustained release formulation.

5 47. The composition of claim 37, further comprising at least one pharmaceutically acceptable carrier.

48. The composition of claim 47, wherein the pharmaceutically acceptable carrier is an adjuvant.

49. The composition of claim 47, wherein the pharmaceutically acceptable carrier is selected from the group consisting of water, an oil, a saline solution, aqueous dextrose and glycerol solution.

50. An immunogenic composition comprising a cell exogenously expressing an APC chemotaxin.

51. The immunogenic composition of claim 50, wherein the cell is allogeneic.

52. The immunogenic composition of claim 50, wherein the cell is autologous.

53. The immunogenic composition of claim 50, further comprising a tumor-associated antigen.

20 54. The immunogenic composition of claim 50, wherein the cell is a cancer cell.

55. The immunogenic composition of claim 54, wherein the cancer cell is from a cancer cell line.

25 56. The immunogenic composition of claim 55, wherein the cancer cell line is a human ovarian cancer cell line or a human brain cancer cell line.

57. The immunogenic composition of claim 50, further comprising a tumor-associated antigen.

58. The immunogenic composition of claim 57, wherein the tumor-associated antigen is obtained from an autologous cell of a subject.

5 59. An immunogenic composition, comprising:

- (a) at least one tumor cell, and
- (b) at least one cell exogenously expressing an APC chemotaxin.

60. The immunogenic composition of claim 59, wherein the tumor cell is a primary tumor cell.

61. The immunogenic composition of claim 59, wherein the tumor cell is autologous to a subject to whom the immunogenic composition is intended.

62. The immunogenic composition of claim 59, wherein the tumor cell is a glioma, glioblastoma, gliosarcoma, astrocytoma, melanoma, breast cancer cell or an ovarian cancer cell.

63. The immunogenic composition of claim 59, wherein the tumor cell is quiescent.

64. The immunogenic composition of claim 59, wherein the tumor cell is a cancer cell.

20 65. The immunogenic composition of claim 59, wherein the cell exogenously expressing an APC chemotaxin is allogenic.

66. The immunogenic composition of claim 59, wherein the cell exogenously expressing an APC chemotaxin is quiescent.

67. A method of formulating a composition capable of eliciting an immune response to an antigen in a subject comprising:

- 25 (a) isolating a polypeptide having an activity of an APC chemotaxin, and

(b) combining the polypeptide with the antigen.

68. A kit comprising:

(a) a pharmaceutical composition comprising an APC chemotaxin and a pharmaceutically acceptable carrier, and

5 (b) a syringe.